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US Army Corps
of Engineers
New England District

✓ - subtidal
✓ - show tide lines
✓ - have QC samples be blind to chemist
✓ - sitewater
✓ - make sure bungs don't hit seds at LT

USACE CONTRACT NO. W912WJ-12-D-0004
TASK ORDER NO. 10

AEROVOX PASSIVE SAMPLER SURVEY
DRAFT FIELD SAMPLING PLAN

ENVIRONMENTAL MONITORING, SAMPLING, AND ANALYSIS
NEW BEDFORD HARBOR SUPERFUND SITE

New Bedford, Massachusetts

June 2017

Prepared for

U.S. Army Corps of Engineers
New England District
Concord, Massachusetts 01742-2751

Prepared by

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ABBREVIATIONS AND ACRONYMS

APP	Accident Prevention Plan
COC	chain of custody
DoD	Department of Defense
EDD	electronic data deliverable
EPA	United States Environmental Protection Agency
FSP	field sampling plan
GPS	global positioning system
ID	identification
MaCORS	Massachusetts Continuously Operating Reference System
PCB	polychlorinated biphenyl
PED	polyethylene device
PRC	performance reference compound
QA	quality assurance
QC	quality control
RTK	real time kinetic
R/V	research vessel
UFP-QAPP	Uniform Federal Policy Quality Assurance Project Plan
USACE NAE	United States Army Corps of Engineers New England District

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1. GENERAL

Project Title	Environmental Monitoring, Sampling and Analysis, New Bedford Harbor Superfund Site, New Bedford, Massachusetts (MA)
Survey Title	Aerovox Passive Sampler
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2. INTRODUCTION

2.1 Site Location and Description

The New Bedford Harbor Superfund Site (Site), located in Bristol County, Massachusetts, extends from the shallow northern reaches of the Acushnet River estuary south through the commercial harbor of New Bedford and into adjacent portions of Buzzards Bay. Industrial and urban development surrounding the harbor has resulted in sediments becoming contaminated with high concentrations of many pollutants, notably polychlorinated biphenyls (PCBs) and heavy metals, with contaminant concentrations generally decreasing from north to south. The source of the PCB contamination has been attributed to two electrical capacitor manufacturing facilities that operated between the 1940s and 1970s. One facility, the former Aerovox Corporation, is located near the northern boundary of the Site, and the other, Cornell-Dubilier Electronics, Inc., is located immediately south of the New Bedford Harbor hurricane barrier (Figure 1). The United States Environmental Protection Agency (EPA) added New Bedford Harbor to the National Priorities List in 1983 as a designated Superfund Site. U.S. Army Corps of Engineers, New England District (USACE NAE) is responsible for carrying out the design and implementation of remedial measures at the site through an Interagency Agreement with EPA. USACE and EPA have requested the collection of field data to better understand groundwater discharge from the former Aerovox facility to the Upper Harbor to assist with remediation planning.

2.2 Scope of Work

The primary objective of this survey is to measure the freely dissolved PCB concentrations in porewater and surface water adjacent to the former Aerovox facility. The measured PCB concentration gradients between the porewater and the overlying surface water can be used to calculate diffusive flux of freely dissolved PCBs from the sediment to the water column.

The survey objective will be achieved using polyethylene devices (PEDs) which will be mounted in metal frames and partially inserted into the sediment bed so that a portion of the PED is exposed to the water column. This mode of sampling allows simultaneous collection of porewater and overlying surface water data with one sampler, which is sectioned into two samples after retrieval. The PEDs will be deployed for approximately one month, which will yield time-averaged PCB concentrations that are more representative than grab samples of porewater and surface water.

This Field Sampling Plan (FSP) addresses 1) preparation of PEDs; 2) deployment of PEDs at 21 locations near the former Aerovox facility and recovery after approximately 30 days; 3) extraction and analysis of PEDs; 4) calculation of dissolved aqueous PCB concentrations in porewater and overlying surface water, and 5) calculation of dissolved PCB flux out of (or into) the sediment. Details regarding the analytical testing of PEDs are described in the Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) Addendum (Battelle, 2017) with modifications specified in this FSP for the collection and analysis of PED samples.[1,2]

2.3 Schedule of Operations

The Aerovox passive sampler survey will commence upon approval of this FSP. PEDs are scheduled to be deployed during the week of July 10, 2017. A total of three days has been planned for deployment and recovery of the samplers (two days for deployment and one day for recovery). PEDs will be recovered approximately 30 days after deployment. The deployment and recovery dates may be modified if weather or site conditions pose safety concerns or could negatively affect data quality.

2.4 Key Personnel

Key personnel for this survey is summarized in Table 1 by organization and role. Battelle team personnel will sign in and sign out at the Jacobs field trailer at the beginning and end of each field day. Field staff working on the water will file a float plan daily at the Jacobs trailer.

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[1] The Battelle 2015 QAPP Addendum was approved for collection and analysis of PED samples based on DoD QSM 4.2 (2003); this FSP updates that information to current standards via reference to Battelle 2017.

[2] The Battelle 2017 QAPP provides details for sampling and analysis of additional matrices and chemical parameters. For the current effort, only the information related to the sampling and analysis of PEDs for PCB congeners is applicable.

3. METHODS

The UFP-QAPP Addendum (Battelle, 2017) contains general information on sampling and analytical methods. However, where details are provided in this FSP they supersede the UFP-QAPP. PEDs will be spiked with PRCs using the method described by Booij et al. (2002) as summarized below.

3.1 Laboratory Preparation of PEDs

PEDs will be prepared for deployment at the Battelle laboratory in Norwell, Massachusetts following internal standard operating procedures. Preparation includes cleaning the PEDs, spiking the cleaned PEDs with performance reference compounds (PRCs), and placing the cleaned, spiked PEDs into metal frames in preparation for field deployment.

For cleaning, the PEDs (Figure 2) will be cut to the appropriate size (approximately 15 × 40 centimeters) and cleaned by soaking the PEDs in hexane/acetone mixture (1:1 by volume) on a shaker table overnight, draining the cleaning solvent, adding fresh solvent and repeating the process for a total of three nights. After the final soak, the samplers will be rinsed with Milli-Q water and then either used immediately for spiking or air dried in jars, then capped with Teflon®-lined lids and stored in the refrigerator. clarify?

PCB congeners PCB38, PCB78, PCB79, and PCB186 were selected as PRCs because 1) they were not components of any Aroclor formulation; 2) they do not coelute with any of the PCB congeners of concern, and 3) they cover a broad range of physicochemical properties. Target loads of PRCs (0.2 micrograms [µg] of each PRC per PED) were selected to ensure that the PRCs will be above the reporting limit even if 90% of the PRC is lost during the deployment. The mass of each PRC that should be added to the spiking solution to achieve these loads was calculated using the equation provided by Booij et al. (2002).

Two 1-liter jars containing ~800 to 900 mL of 80:20 (by volume) methanol/water solution of the PRCs will be prepared to accommodate 40 samplers (20 samplers per jar). The jars will be capped with Teflon®-lined lids and placed on a shaker table for one week at room temperature. After one week, PEDs will be removed from the spiking jars using forceps, gently rinsed with Milli-Q water, shaken to remove excess water, and mounted in solvent-cleaned metal frames fabricated from stainless steel piano hinges (Figure 3). Assembled PEDs in frames will be wrapped in solvent-cleaned aluminum foil (foil edges sealed by folding), the foil packet placed in a large plastic bag, and then stored in the freezer (-20 °C) until field deployment.

At least two PEDs from each PRC spiking container will be retained at the laboratory for PCB analysis to measure pre-deployment PRC concentrations. PEDs will be tracked so that the field-deployed PEDs can be traced back to the PRC spiking container in which they were prepared. PRC loss will be calculated by comparing the post-deployment PRC concentrations with the pre-deployment concentrations in an unexposed PED from the same PRC spiking container.

3.2 Field Sample Collections

3.2.1 Survey Locations

The 21 survey locations for passive sampling measurements were selected by Jacobs (Figure 4, Table 2). If steep slopes or rip-rap are encountered, then the station location will be moved to a more suitable nearby location.

The coordinates of the deployment locations will be captured using a real-time kinematic (RTK) global positioning system (GPS) unit that communicates with the Massachusetts Department of Transportation Massachusetts Continuously Operating Reference System (MaCORS) to receive real-time positioning data. A RTK GPS unit with vertical accuracy of <0.1 feet will be used to measure the surface water elevation at each deployment location relative to the North American Vertical Datum of 1988 (NAVD88). The water depth at each survey location will be measured using a stadia rod, and the elevation of the sediment surface will be calculated by subtracting the water depth from the water surface elevation. Station coordinates, water surface elevation, and water depth will be recorded on a PED Field Log (Attachment A).

3.2.2 PED Deployment and Recovery

PEDs will be deployed from Battelle's Research Vessel (R/V) *Gale Force*, a 20-foot pontoon boat. The PEDs will be pushed into the sediment about halfway using a pole with a custom-designed PED frame hold/release system. Just prior to deployment, the water depth will be measured and a PED will be loaded into the deployment pole. The deployment pole is calibrated so that the pole will be pushed down until the water surface is at the same measurement as the water depth. Starting at this depth, the PED will be inserted halfway into the sediment. The PEDs will be inserted into the sediment in a north/south direction to minimize drag from the current.

The bottom half of the PED, buried in the sediment, will sample the porewater, and the top half will sample the water column (Figure 3). A marker buoy will be attached by a line to each sampler to facilitate retrieval. A field duplicate sampler will be inserted at one of the 21 locations. PEDs will be deployed for approximately 30 days. ①

At the end of the deployment period, the PEDs will be retrieved by pulling on the line attached to the buoys. If a significant amount of sediment is still attached to the sampler, PED/frames will be gently rinsed with site water to remove excess sediment. The assemblies will then be wrapped in solvent-cleaned aluminum foil (seal edges of foil by folding) and the foil packet will be placed in a large heavy-duty plastic bag. During PED recovery, the field staff will document on the field log if any of the PEDs appears to have been dislodged from the sediment during the deployment period. The PEDs will be transported on ice and under custody to the Battelle Norwell laboratory. ②

is this site tap water or river water?

3.3 Laboratory Testing

The PEDs will be visually inspected at the Battelle Norwell laboratory to verify the sediment-water interface and check for evidence of biofouling. Each PED will be photographed. If the PEDs have significant biofouling and/or excess water, they will be gently wiped with a Kimwipe. PEDs will be cut out from the frames (only the visible part of PEDs will be used, while the part inside the metal frame will be discarded) and then cut in two along the sediment-water interface line. Two sections will be cut from each PED for analysis: the 6-inch (15-cm) interval above the sediment-water interface, and the 6-inch (15-cm) interval below the sediment-water interface. The remainder of the PED will be frozen and archived.

The PED extraction, clean-up, and analysis procedures will follow Battelle's internal standard operating procedure for PCB congeners in solids (Battelle, 2017) with the modifications described in this FSP. Each PED section will be transferred to a glass extraction container, spiked with PCB surrogate internal standards, and extracted three times with hexane. The combined extract will be dried over sodium sulfate, concentrated, and cleaned as needed using alumina and size exclusion chromatography. The final extract will be further concentrated and spiked with internal standards prior to extraction. Post-extraction, PEDs will be dried and weighed to five decimal places for data reporting purposes. All data reported from the laboratory will be in nanograms per gram (ng/kg) of PED.

The PED from the field duplicate station will be treated the same way as all the other PEDs (the parent and field duplicate PEDs will be analyzed separately). Because each PED will be cut in two (porewater and surface water) sections, the total number of field-exposed samples for analysis will be double the number of deployed PED frames (21 stations + 1 field duplicate = 22 samplers; 22 samplers x 2 parts = 44 field-exposed PED samples to be analyzed). A trip blank PED and four unexposed, PRC-spiked PEDs (two from each spiking batch) will also be analyzed. PEDs will be analyzed for 139 PCB congeners. The target analyte list is provided in UFP-QAPP Addendum Worksheet #15 (Battelle, 2017). The 139 congeners represent 95% or more of the PCBs in the environment and include the congeners found in the nine major Aroclor formulations.

3.4 Data Analysis

3.4.1 Calculation of Dissolved Aqueous PCB Concentration

Battelle will calculate freely dissolved aqueous concentrations of PCBs in porewater and surface water using the results of PED PCB analysis following the steps described below.

1) Mass of contaminant per PED sampler will be divided by the mass of the sampler (measured after extraction) to obtain the mass of contaminant per g of sampler, C_{PED} (ng/g PED).

2) Polyethylene-water partition coefficients, K_{PED}, will calculated using the following equation (EPA, 2012):

$$\log K_{PED} = -0.59 + 1.05 \log K_{OW}$$

where K_{OW} is the octanol-water partition coefficient.

3) Fractional equilibration (f) will be calculated to determine if non-equilibrium sampling correction is necessary using the following equation from Gschwend et al. (2014):

$$f = \frac{C_{PED0,r} - C_{PEDt,r}}{C_{PED0,r}}$$

where $C_{PED0,r}$ is the initial concentration of PRC in PED sampler, $C_{PEDt,r}$ is the concentration of PRC in PED sampler at retrieval, and t is the exposure time. The fractional equilibration will be calculated for each spiking container (jar) of samplers separately.

4) For PEDs at equilibrium ($f > 0.9$ according to Gschwend et al., 2014), water (porewater or overlying surface water) concentrations (C_w) will be calculated using the following equation (Adams, et al. 2007):

$$C_w = \frac{C_{PEDt}}{K_{PED}}$$

where $C_{PED\,t}$ is the concentration of analyte in PED sampler at time t.

5) If the PEDs require non-equilibrium condition correction ($0.1 < f < 0.9$; Gschwend et al., 2014), the calculations will follow those described by (Adams, et al. 2007) according to which the exchange rate coefficient, k_e, is calculated using the equation:

$$k_e = \ln\left(\frac{C_{PED0,r}}{C_{PEDt,r}}\right) t^{-1}$$

and the concentration of the analyte in water at equilibrium $C_{w\infty}$, can be then calculated using the equation:

$$C_{w\infty} = \frac{C_{PEDt}}{(1 - e^{-k_e t})K_{PED}}$$

6) If any of the PED samplers reveal fractional equilibrations of less than 0.1, then use of these data will be evaluated by the Battelle Task Lead, as correcting passive sampler data with such low equilibrations carries significant uncertainty (Gschwend et al., 2014).

3.4.2 Calculations of PCB Flux Across the Sediment-Water Interface

Flux

Diffusive flux (F) of dissolved PCBs across the sediment-water interface will be calculated using Fick's first law of diffusion following the method described by (Fernandez, et al. 2014):

$$F = -\frac{D_W}{\delta_{BL}}(C_W - C_{PW})$$

where D_W is the compound's diffusivity in water, δ_{BL} is the boundary layer thickness (0.02 cm), and C_W is the surface water concentration, and C_{PW} is the porewater concentration. Positive value of F indicates flux from sediment into the water column, while negative F indicates flux from the water column into the sediment.

The laboratory method detection limit (MDL) and limit of quantitation (LOQ) for PCB congeners on the PED matrix is based on the extraction and analysis of solid phase samples because the analytical methods are very similar. The method detection limits and limits of quantification will be reported with the data based on the lowest level calibration standard analyzed and sample-specific preparation and analysis factors.

4. QUALITY ASSURANCE/QUALITY CONTROL

A summary of all quality assurance (QA) and quality control (QC) procedures is provided in this section. For specific details, please refer to the UFP-QAPP Addendum (Battelle, 2017); sampling and analytical measurement performance criteria can be found in Worksheet #12, #24, and #28.

4.1 Field-Based Quality Control

The GPS operation will be checked twice daily before and after PED deployment and recovery and the results will be recorded on the Summary of Daily Field Activities log (Attachment B). A location on the decontamination pad at the Sawyer Street facility will serve as the calibration waypoint.

Field-based QC samples will include a field replicate (i.e., duplicate PED deployed at one station) and a trip blank. The purpose of the field replicate is to assess precision. A field replicate will be deployed and recovered at the same time, as close as possible from the same location, using the same techniques, and will be analyzed at the same laboratory. Field replicate will be handled, containerized, stored and transported in the same manner as all field samples.

A PED trip blank will be collected for this survey to assess contamination introduced during shipping and field handling procedures. The PED trip blank will be comprised of one PED that is placed in a metal frame and packed the same way as the other PEDs (i.e., wrapped in solvent-cleaned aluminum foil with edges sealed by folding and then placed in large plastic bag; see Section 3.1). The PED trip blank will be transported to the field during deployment and recovery operations. During deployment at one of the survey locations, the field staff will remove the PED trip blank from the plastic bag and open the aluminum foil to expose the PED trip blank to the same atmospheric conditions encountered during PED deployment. The PED trip blank will be exposed for the same amount of time as it takes to deploy the PED at the survey location (e.g., approximately 10 to 15 minutes). After this period, the PED trip blank container will be resealed (aluminum foil packet closed, sealed and placed in large plastic bag), placed into a shipping cooler, and returned to the laboratory for frozen storage until the PEDs are ready to be recovered. During recovery, the PED trip blank will again be brought out into the field and exposed to the atmosphere (as described above) to simulate recovery and handling conditions. Once recovery operations are complete at the survey location, the PED trip blank container will be resealed and transported under custody to the Battelle laboratory in the same manner as the PED samples for analysis. The field log will document at which survey location the PED trip blank is collected.

4.2 Laboratory-Based Quality Control

Laboratory QC samples for PED extraction and analysis consist of: a method blank, laboratory control sample and laboratory control sample duplicate, surrogate recovery standards, and internal standards. The frequency and measurement performance criteria are as defined in Battelle (2017) for PCB congeners in solid samples (worksheets #12 and 28).

4.3 Sample Handling and Custody Procedures

After field collection, samples will be transferred to Battelle's Norwell laboratory for analysis. Recovered PEDs (in the frames) will be wrapped in solvent-cleaned aluminum foil with edges sealed by folding the foil, and the foil packet will be placed in a large plastic bag to prevent cross contamination. Each bag containing a sample will be labeled with waterproof, adhesive-back labels. Sample labels will provide sufficient detail to uniquely identify each sample and allow tracking to field activities, and will include the station identification (ID), collection date/time, intended analysis, and sample collector initials. Sample bags will then be placed inside a cooler (padded with bubble wrap) for transport to the analytical laboratory (Battelle's Norwell, Massachusetts laboratory). All samples will be stored on ice in the field. Samples will be stored in the laboratory for up to 14 days at 4 ± 2 °C or up to 1 year frozen.

Chain-of-custody (COC) forms will be initiated in the field. The packed coolers will be secured shut with custody seals and packing or similar heavy-duty tape. If sample custody is transferred to Battelle staff to transport samples to the Battelle Norwell laboratory, then custody seals will not be utilized. Each cooler containing samples will have a corresponding original COC form that is stored in a plastic Ziploc® bag. The original, signed COC forms will accompany the samples from the field to the laboratory.

Copies of the COC forms will be kept in the field logbook as well as electronic versions kept in Battelle project files. Scanned copies of the fully signed COCs will be submitted via e-mail to the USACE Project Chemist within 48 hours of receipt at the laboratory.

4.4 Decontamination

Decontamination is the process of neutralizing, washing, and rinsing exposed surfaces of equipment to minimize the potential for contaminant migration and/or cross contamination. This procedure does not apply to personnel decontamination that is described in the project Accident Prevention Plan (APP; Battelle, 2016). At the site, the primary source of PCBs and other contaminants is from sediments.

All the sampling equipment will be decontaminated prior to use in the field. It is not anticipated that any reusable equipment will come into contact with the PEDs; therefore, field decontamination will not be necessary.

4.5 Communication and Documentation of Deviations

Any modifications or changes to the planned activities are deviations and must be approved by the USACE NAE Project Manager, or his/her designee. Any deviations from required protocols anticipated prior to field or analytical work must be reported to the Battelle Project Manager in advance. The Battelle Project Manager will assess the potential impact and contact the USACE NAE Project Manager (or his/her designee). If circumstances in the field require deviations from the UFP-QAPP Addendum or this FSP, the Battelle and USACE NAE Project Managers must be contacted as soon as it is safe to do so. All deviations must be documented as such in the Battelle field logbook and brought to the attention of the Battelle and USACE NAE Project Managers at the end of the survey. The field log should indicate the date and time that the Battelle Project Manager was contacted from the field and any resulting verbal approval. The documentation should include a description of the deviation and the reason, an assessment of impact that the deviation has on the study objectives and data quality, and any corrective action implemented. A discussion of deviations will be included in the year end summary report.

5. DOCUMENTATION AND REPORTING

The Chief Scientist is responsible for ensuring that all events are adequately documented on the appropriate log forms (Attachment A). The Battelle field logbook will contain documentation of PED deployment/recovery coordinates and GPS calibration checks (Attachment B).

5.1 Sample Identification

PED samples collected for analysis in support of this survey will be identified in accordance with previously established conventions for the site under the Data Management Plan (Battelle, 2002) as described below. All pertinent information will be recorded for all samples, including: 1) sample ID, 2) collection location, 3) date and time of collection, 4) required analyses (i.e., PCB congeners), 5) sample preservation method, and 6) the sampler's initials. For the PED samples, the sample ID is assigned upon recovery.

Sample ID for PED collected under this task will have the following format:

P – YYP – ADP-XX-XX

where:

P	= Passive sampler (PED) matrix prefix
YYP	= Sampling year and month (2 digit year plus 1 alpha character, see Table 3)
ADP-XX-XX	= Station identifier (ADP, two letters, two digits, Table 2)

QC sample codes will be unique in that the appropriate QC suffix (Table 4.) will be added to the existing sample ID as defined below:

REP "Sample ID" REP

Keep blank

where

Sample ID	= appropriate field sample ID as described above
REP	= Field replicate suffix

Trip blank ID will follow the below format:

TB – MMDDYY – ##

where

TB	= Trip blank
MMDDYY	= Recovery date in the month/day/year format
##	= Two digit number

5.2 Reporting

Specific reporting requirements are detailed in the project UFP-QAPP Addendum (Battelle, 2017). Reporting requirements for the field sampling and laboratory analysis activities will include:

- Sample Collection Table – A data table summarizing PED deployment location coordinates and sediment surface elevations will be submitted to USACE NAE and EPA after the survey, and is due within 2 weeks of survey completion.
- Field EDDs – The field electronic data deliverables (EDDs) that document sample collection information will be submitted to the project Database Custodian.
- Chain of Custody – A scanned copy of the signed COC forms will be submitted to the USACE NAE Project Chemist within 48 hours of sample receipt at the laboratory.
- Monthly Record of Work-Related Injuries/Illness & Exposure – This form will be submitted to the USACE NAE Engineering Technical Lead and Safety and Occupational Health Manager on the 10th of each month. A copy of the form is provided with the APP (Battelle, 2016).
- Summary Report -- A summary report will be prepared at the completion of the PED data analyses, including supporting appendices.
- The field logbook will be maintained at Battelle, and will include original field logs.

6. SAFETY PROCEDURES

For further details on safety procedures, please refer to the APP (Battelle, 2016).

All Battelle employees participating in the sampling efforts will be certified in hazardous waste operations, with current refresher certifications. Daily safety briefings will be conducted by the Chief Scientist field personnel in attendance. Field crew will don appropriate personal protective equipment at all times while in the field. This includes Tyvek® suits or waterproof foul-weather gear, personal flotation devices, safety glasses, gloves, or rubber boots.

7. REFERENCES

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FIGURES

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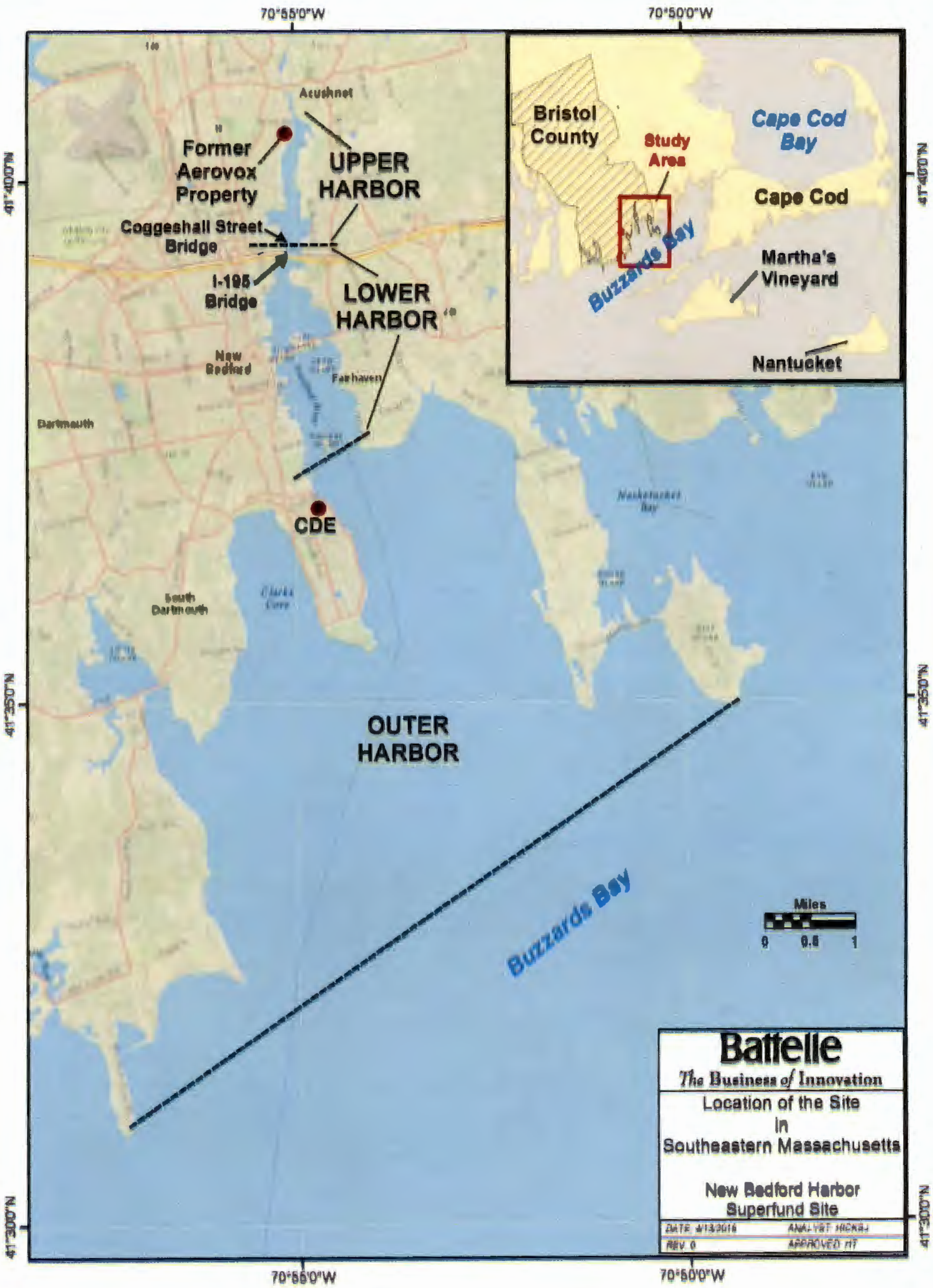

CDE = Cornell-Dubilier Electronics

Figure 1. Location of the Aerovox facility within the New Bedford Harbor

Figure 2. PED Prior to Being Cleaned and Spiked with PRCs

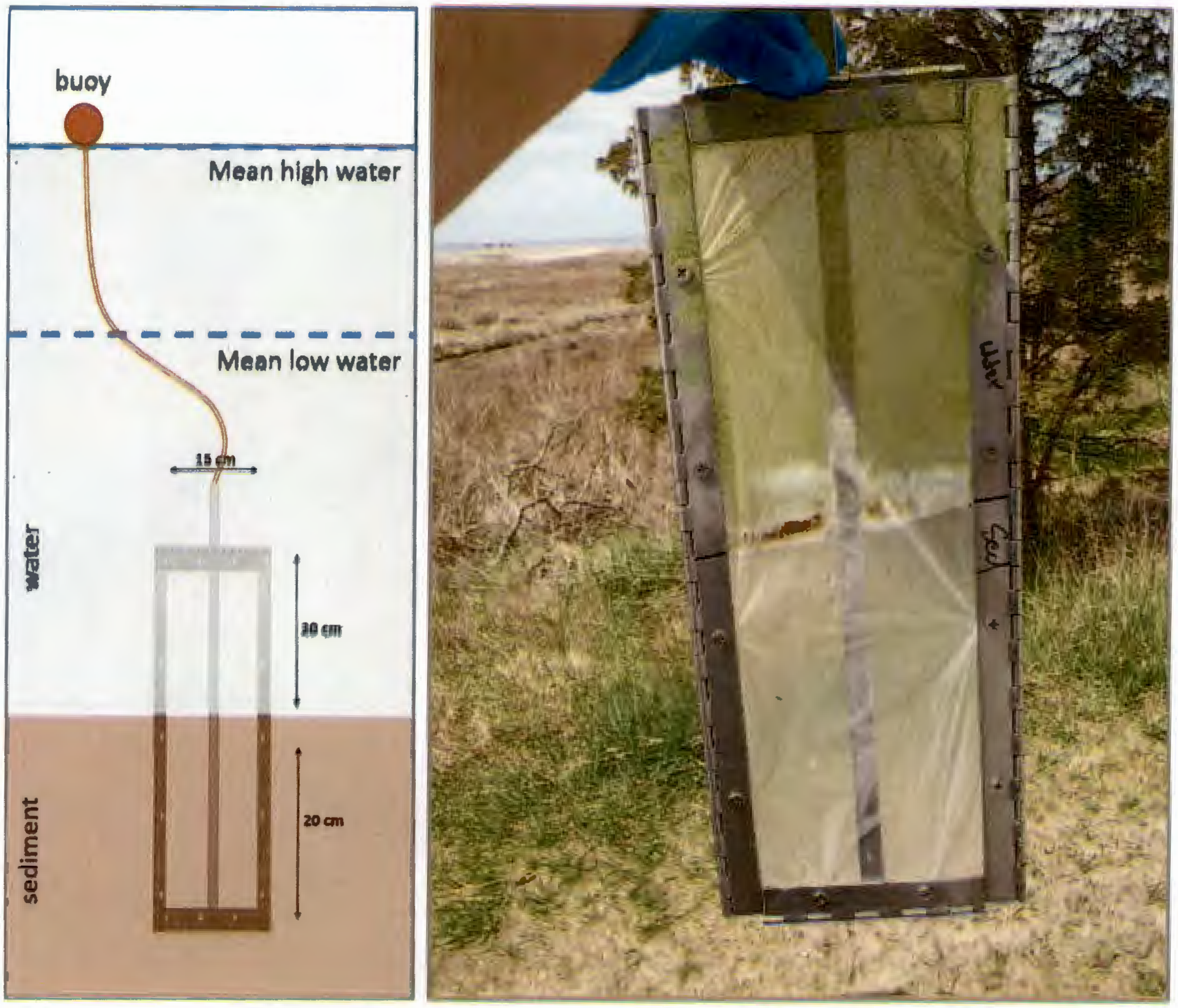

Figure 3. Schematic of PED Deployment (left)) and Post-Deployment PED Frame with Biofouling in the Water Column-Exposed Part (right)

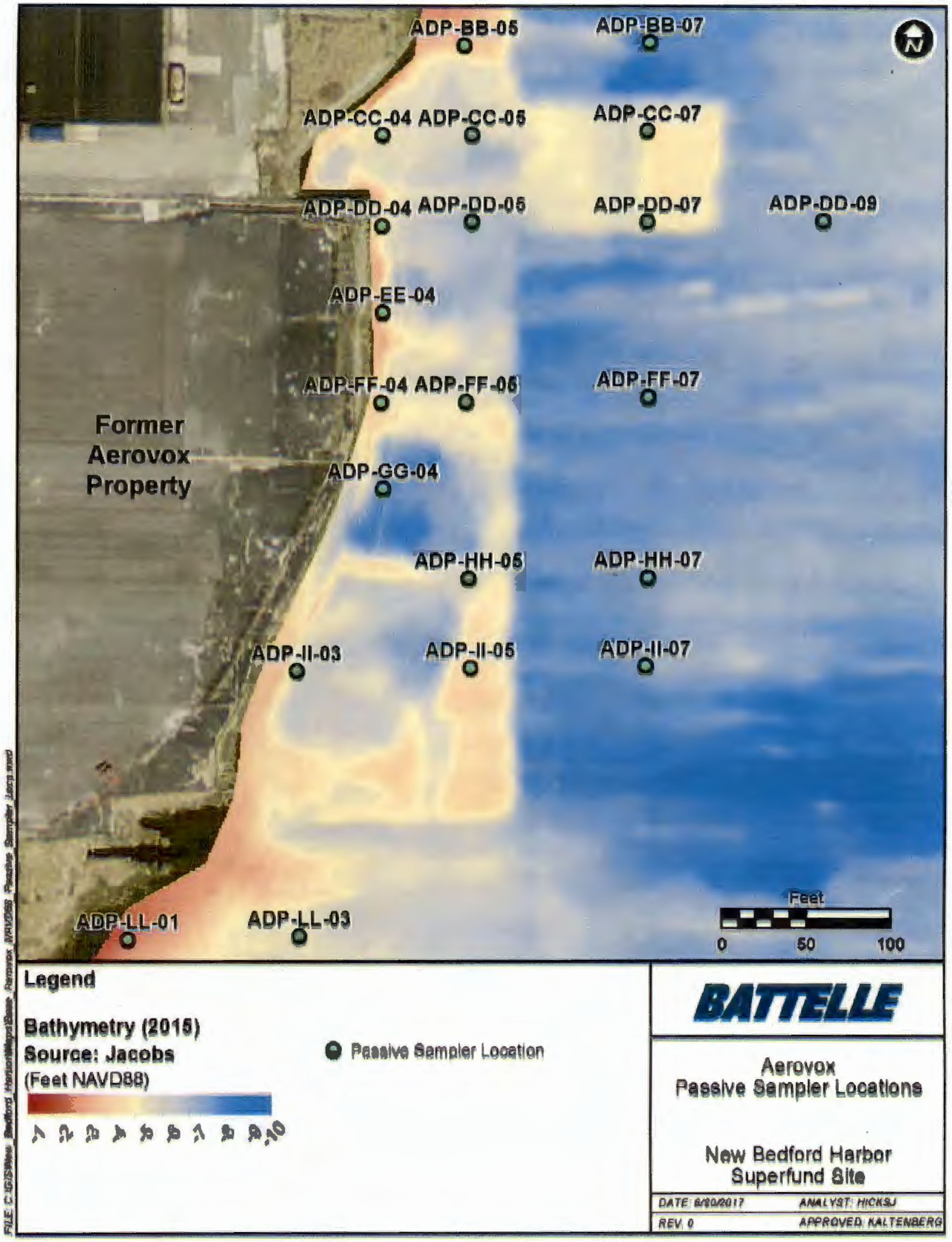

Figure 4. Location of the Passive Sampler Deployment Locations

TABLES

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Table 1. USACE, EPA, and Battelle Team Contact List

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Notes: O – office, M - mobile

Table 2. Aerovox Area Passive Sampler Locations

Station ID	Easting (X)[1]	Northing (Y)[1]
ADP-BB-05	815679.73	2707118.74
ADP-BB-07	815789.60	2707120.79
ADP-CC-04	815631.52	2707065.57
ADP-CC-05	815684.41	2707065.86
ADP-CC-07	815788.24	2707068.41
ADP-DD-04	815631.23	2707011.51
ADP-DD-05	815684.41	2707014.14
ADP-DD-07	815788.48	2707014.29
ADP-DD-09	815892.51	2707014.67
ADP-EE-04	815631.82	2706960.67
ADP-FF-04	815630.94	2706907.78
ADP-FF-05	815681.20	2706908.37
ADP-FF-07	815789.31	2706911.29
ADP-GG-04	815632.11	2706857.24
ADP-HH-05	815682.95	2706804.64
ADP-HH-07	815789.31	2706805.23
ADP-II-03	815581.27	2706750.29
ADP-II-05	815684.12	2706752.05
ADP-II-07	815788.14	2706753.51
ADP-LL-01	815481.28	2706592.64
ADP-LL-03	815582.94	2706594.38

[1] MA State Plane NAD83 (feet)

Table 3. Month and Associated Alpha Character for Phase ID Sampling

Month	Alpha Character		Month	Alpha Character
January	J		July	L
February	F		August	G
March	M		September	S
April	A		October	O
May	Y		November	N
June	U		December	D

Table 4. Examples of Phase ID Labeling in the Sample Identification Scheme

Sample Type	Suffix	Format	Example ID
Field Sample	-	"SampleID"	P-17L-ADP-BB-05
Field Replicate (= Duplicate)	REP	"SampleID"REP	P-17L-ADP-BB-05-REP
Trip Blank	TB	TB-MMDDYY-##	TB-080117-01